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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,125	02/26/2004	Cynthia W. Berry	1215-0506P (000550-078)	1857
2292 7590 01/30/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747			EXAMINER	
			GEBREMARIAM, SAMUEL A	
FALLS CHURC	H, VA 22040-0747		ART UNIT	PAPER NUMBER
•			2811	
SHORTENED STATUTORY	PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE	
3 MON	THS	01/30/2007	ELECTRONIC	

# Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 01/30/2007.

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	Application No.	Applicant(s)
	10/786,125	BERRY ET AL.
Office Action Summary	Examiner	Art Unit
	Samuel A. Gebremariam	2811
The MAILING DATE of this communication ap	pears on the cover sheet with	the correspondence address
3) Since this application is in condition for allowa	DATE OF THIS COMMUNICATION OF THIS COMMUNICA	ATION.  By be timely filed  AS from the mailing date of this communication.  NDONED (35 U.S.C. § 133).  The state of the mailing date of the ments is a simple of the second of the ments is a simple of the ments is a simpl
closed in accordance with the practice under	∟x parte Quayle, 1935 C.D.	11, 453 O.G. 213.
A) Claim(s) 9-15 is/are pending in the application 4a) Of the above claim(s) 10-13 is/are withdra 5) Claim(s) is/are allowed. 6) Claim(s) 9,14 and 15 is/are rejected. 7) Claim(s) is/are objected to. 8) Claim(s) are subject to restriction and/o Application Papers  9) The specification is objected to by the Examin 10) The drawing(s) filed on is/are: a) accompany and applicant may not request that any objection to the Replacement drawing sheet(s) including the correct 11) The oath or declaration is objected to by the Examin 10.	ewn from consideration.  For election requirement.  For election requirement.  For election requirement objected to by the drawing(s) be held in abeyance of the drawing(s).	e. See 37 CFR 1.85(a). ) is objected to. See 37 CFR 1.121(d).
Priority under 35 U.S.C. § 119  12) Acknowledgment is made of a claim for foreign a) All b) Some * c) None of:  1. Certified copies of the priority document 2. Certified copies of the priority document 3. Copies of the certified copies of the priority document application from the International Bureat * See the attached detailed Office action for a list	nts have been received. nts have been received in Apport onty documents have been re au (PCT Rule 17.2(a)).	plication No eceived in this National Stage
Attachment(s)  1) Notice of References Cited (PTO-892)  2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  3) Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date  5. Patent and Trademark Office TOL-326 (Rev. 08-06)	Paper No(s)/	mmary (PTO-413) Mail Date ormal Patent Application . Part of Paper No./Mail Date 20070120

## **DETAILED ACTION**

### Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:
 The specification shall conclude with one or more claims particularly pointing out and distinctly

claiming the subject matter which the applicant regards as his invention.

2. Claims 10-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The scope of claims 10-13 is unclear because the claims depend on cancelled independent claim 1. Therefore claims 10-13 are withdrawn from consideration.

### Claim Rejections - 35 USC § 103

- 3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al., US patent No. 6,528,875 in view of Uchikoba US patent No. 6,698,084.

Regarding claim 9, Glenn teaches (fig. 1a): a co-fired (stacked ceramic is fired together) multilayer laminate ceramic (fig. 1a and col. lines, 35-37); plurality of stacked co-fired (fired together) layers of a predetermined type of ceramic material (30,32,34) including metallization (19, 21, where vias 21 are filled with conductors) in predetermined patterns on and through the layers (30 and 32); a plurality of exposed electrical conductors (layer 19 that is exposed and connected to 20) including leads (18)

at a predetermined locations on the plurality of stacked layers (30,32,34); the conductors being comprised of a metal paste/layer including one or more additives to promote adhesion to the layers of ceramic material (conductor 19 is formed of goldnickel alloy, gold-nickel alloys adheres well on ceramic); a bonding metal layer (20) located on top of the exposed electrical conductors (19) at the locations of the leads (18) and bonded to the bonding metal layer (20) at the predetermined locations.

Glenn does not explicitly teach that the bonding metal layer being of the same metal as the conductors, however devoid of the one or more additives.

Uchikoba teaches (figs. 1A-1C) forming a conductive electrode (43) that is formed of gold and nickel and connected a gold bump (31, no nickel) in the structure of forming a semiconductor device package.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the gold-nickel to gold connection taught by Uchikoba in the structure of Glenn in order enhance the reliability of the bonding during operation. Therefore the combined structure of Glenn and Uchikaba teaches the bonding metal layer being of the same metal as the conductors (gold), however devoid of the one or more additives (nickel is taken to be the additive) and the leads are bonded to the bonding metal layer at the predetermined locations.

5. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn in view of Uchikoba and in further view of Auerswald US patent No. 6,698,084.

Regarding claim 14, Glenn teaches (fig. 1a) a co-fired multi-layer laminate structure comprising (10): a plurality of stacked co-fired layers (30,32,34) of a predetermined type of ceramic material (stacked ceramic fired together) including metallization (19,21, where vias 21 are filled with conductors) in predetermined patterns on and through the layers (30,32,34), a plurality of exposed electrical conductors (layer 19 that is exposed and connected to 20) including leads (18) located at predetermined locations on the plurality of stacked layers; the conductors being comprised of a metal paste/layer including one or more additives to promote adhesion to the layers of ceramic material (conductor 19 is formed of gold-nickel alloy, gold-nickel alloys adheres well on ceramic); a bonding metal layer (20) located on top of the exposed electrical conductors (19) at the locations of the leads (18) and being of the same metal as the conductors (19); wherein the leads are bonded to the bonding metal layer (20) at the predetermined locations; the conductors are comprised of a gold paste/layer.

Glenn does not teach that the bonding metal layer is the same metal as the conductor however devoid of the one or more additives so as to enhance bond ability of the leads thereon, wherein the additives is selected from a group of materials including copper, bismuth and glass and the bonding metal layer is comprised of a pure gold paste devoid of the additives.

Uchikoba teaches (figs. 1A-1C) forming a conductive electrode (43) that is formed of gold and nickel and connected a gold bump (31, no nickel) in the structure of forming a semiconductor device package.

Auerswald teaches the use of additives such bismuth in particular paste made of gold in a structure of forming automatic-machine-bondable ceramic-circuit carrier (col. 2, lines 54-61 an col. 3, lines 5-12).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the gold-nickel to gold connection taught by Uchikoba in the structure of Glenn in order enhance the reliability of the bonding during operation. Therefore the combined structure of Glenn and Uchikoba teaches the bonding metal layer being of the same metal as the conductors (gold), however devoid of the one or more additives (nickel is taken to be the additive) and the leads are bonded to the bonding metal layer at the predetermined locations.

Furthermore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use additive such as bismuth in gold paste in the combined structure of Glenn and Uchikoba as taught by Auerswald in order to form an automatic-machine-bondable ceramic circuit carrier.

The limitation of the bonding metal layer is applied to the conductors prior to a co-firing of said stacked layers of ceramic material and then co-fired along with said layers of ceramic material or the bonding metal layer is applied to the conductors and post fired after an initial co-firing of said layers of ceramic material is not considered because it is a product-by-process claim. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious

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from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

#### Response to Arguments

6. Applicant's arguments filed on 10/31/2006 have been fully considered but they are not persuasive. Applicant argues that the multilayer laminate ceramic structure wherein the conductors are comprised of a metal paste including one or more additives. As stated in the rejection Glen in view Uchikoba teaches the claimed subject matter. The arguments with respect to claims 11-13 is moot because the claims are withdrawn from consideration because they depend on cancelled independent claim 1.

#### Conclusion

7. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Gebremariam whose telephone number is (571)-272-1653. The examiner can normally be reached on 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SAG January 20, 2007

Sara Crane